

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

FUJIMOTO, Ryosuke
Tokyo ST Bldg. 9th Floor
9-4, Hatchobori 4-chome
Chuo-ku
Tokyo 104-0032
JAPON

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year) 24.03.2003	
Applicant's or agent's file reference -	REPLY DUE within 3 month(s) from the above date of mailing
International application No. PCT/JP02/05952	International filing date (day/month/year) 13/06/2002
Priority date (day/month/year) 27/06/2001	
International Patent Classification (IPC) or both national classification and IPC G02B1/00	
Applicant CANON KABUSHIKI KAISHA et al.	

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☐ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☐ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain document cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: **27/10/2003**.

Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner Michel, A Formalities officer (incl. extension of time limits) Hue, S Telephone No. +49 89 2399 7573
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International application No. PCT/JP02/05952

I. Basis of the opinion

1. With regard to the **elements** of the international application (Replacement *sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, pages:

1-52 as originally filed

Claims, No.:

1-43 as originally filed

Drawings, sheets:

1/18-18/18 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
 - ☐ the language of publication of the international application (under Rule 48.3(b)).
 - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority in written form.
 - ☐ furnished subsequently to this Authority in computer readable form.
 - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
 - ☐ the claims, Nos.:

☐ the drawings, sheets.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

☐ the entire international application,

☒ claims Nos. 18-23,

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A written opinion cannot be drawn due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

IV. Lack of unity of invention

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees, the applicant has:

☐ restricted the claims.

☒ paid additional fees.

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- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.
- 2. ☐ This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:
- 3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this opinion:
 - ☒ all parts.
 - ☐ the parts relating to claims Nos. .

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- | | |
|-------------------------------|-------------------|
| 1. Statement | |
| Novelty (N) | Claims |
| Inventive step (IS) | Claims 1-43 (no) |
| Industrial applicability (IA) | Claims 1-43 (yes) |

2. Citations and explanations
see separate sheet

Re. Item III

Third Group: Claims 18-23

The application does not appear to meet the requirements of Article 6 PCT for the following reasons:

It is unclear from the present phrasing of **claim 18**, with respect to what the wavefront deviation is estimated.

It is further not indicated nor is it possible to derive from the present phrasing whether the "wavefront deviation" (b that should satisfy the formula $b < \lambda/4$) is a peak-to-valley (PTV) or a root-mean-square (RMS) figure. Hence the present phrasing does not appear to impose any limitation.

For these reasons, no examination of claims 18-23 appears meaningful.

Re. Item V

0 - The documents mentioned in the International Search Report are labelled as D1 - D8 in their order of appearance.

1 - First Group: Claims 1-4, 7-17, 24-43

1.1 - The application does not appear to meet the requirements of Article 6 PCT for the following reasons:

- The present set of claims contains eight formally independent claims relating to an optical element (claims 1-4, 7 and 24-25) and a manufacturing method (claim 43). However these claims are not independent as to the substance and therefore offend against the requirement of Article 6 PCT as to conciseness. To overcome this objection, it would appear necessary to amend the present set of claims so as to include only one independent claim per category, followed by dependent claims comprising only optional features. Moreover, different limitations imposed on the various independent claims result in an obscure scope of the subject-matter for which protection is sought.
- The subject-matter of **claims 1-2** fails to specify the relationship between the "optical

element" and the "isometric crystal" hence the skilled person cannot reproduce the invention. Hence the present phrasing of claims 1-2 does not appear to impose any limitation. For further examination it has been assessed that the phrasing "isometric crystal" should be replaced by "isometric crystal of which said optical element is made".

It is further unclear to what component the "optical axis" belongs in claims 1-2.

- The subject-matter of **claim 3** fails to specify the relationship between the "optical element", "isometric crystal" and the "optical system" hence the skilled person cannot reproduce the invention. Hence the present phrasing of claim 3 does not appear to impose any limitation. For further examination it has been assessed that the phrasing "isometric crystal" should be replaced by "isometric crystal of which said optical element is made".

The same objection also applies to **claim 4**.

- The subject-matter of **claims 24 and 25** fails to specify the relationship between the "optical system", "optical systems" and the "isometric crystal" hence the skilled person cannot reproduce the invention. Hence the present phrasing of claims 24-25 does not appear to impose any limitation.

It is further unclear from the present phrasing of claims 24-25 to which optical component(s) the "optical axis" and the "[110] axis" respectively belong.

- The subject-matter of **claim 43** fails to specify how the "predetermined process" is actually predetermined. Hence the present phrasing of claim 43 does not appear to impose any limitation. For further examination the second step "performing ... exposed" has been ignored.

1.2 - The application does not meet the requirements of Article 33(1) PCT for the following reasons:

An inventive step in the subject-matter of claims 3, 24 and 25 does not appear to be present in view of document D1 (US 5 867 315 A) (see e.g. the abstract and claims 1, 5, 13, 21, 24 and 27 thereof) (Article 33(3) PCT).

D1 discloses an optical element in which the angle between a crystallographic axis of an isometric crystal of which said optical element is made of, and the optical axis of an optical system using said optical element is lower than 10 degrees (see e.g. the abstract and claims 1 and 5). The selection of the [001] crystallographic axis of said isometric crystal does not appear as inventive.

D1 discloses also an optical system including a plurality of optical elements in which

the angle between a crystallographic axis of an isometric crystal of which said optical elements are made of, and the optical axis of said optical system is lower than 10 degrees (or substantially 0 degree), wherein one axis of more than one of said optical elements perpendicular to a crystallographic axis has a relative angle different from each other (see e.g. the abstract and claims 13, 21, 24 and 27). The selection of the [110] crystallographic axis does not appear as inventive.

Furthermore, the process of exposing e.g. the optical element of claim 3 to ultraviolet light does not appear as inventive.

Thus, the subject-matter of **claims 3, 24, 25 and 43** appears to lack an inventive step in the meaning of Article 33(3) PCT.

For the same reasons as those above concerning claim 3, the subject-matter of **claims 1, 2 and 4** appears to lack an inventive step in the meaning of Article 33(3) PCT.

- An inventive step in the subject-matter of dependent claims 8-17 and 26-42 does not appear to be present in view of document D1 (see e.g. the abstract, claims 1, 5, 10-12, 21, 24 and 27) (Article 33(3) PCT).

Thus, the subject-matter of **claims 8-17 and 26-42** appears to lack an inventive step in the meaning of Article 33(3) PCT.

2 - Second Group: Claims 5-6

2.1 - The application does not appear to meet the requirements of Article 6 PCT for the following reasons:

- The present set of claims contains two formally independent claims relating to the manufacturing of an optical element (claims 5 and 6).
However these claims are not independent as to the substance and therefore offend against the requirement of Article 6 PCT as to conciseness. To overcome this objection, it would appear necessary to amend the present set of claims so as to include only one independent claim per category, followed by dependent claims comprising only optional features. Moreover, different limitations imposed on the various independent claims result in an obscure scope of the subject-matter for which protection is sought.
- The subject-matter of **claim 5**:
 - Fails to specify the specific method step enabling "forming the optical element";

indeed it is not specified how this forming is actually carried out. The above phrasing does not appear to impose any limitation and appears further to constitute an essential step. The skilled person cannot reproduce the method as presently claimed.

- Fails to specify how "controlling the growth" is actually achieved. The above phrasing does not appear to impose any limitation and appears further to constitute an essential step. The skilled person cannot reproduce the method as presently claimed.
- $\langle 001 \rangle$ in claim 5 appears to actually correspond to a crystallographic axis not to a crystallographic face/plane (see e.g. claims 1-4).

The same objections also apply to **claim 6** (also to claim 7 of the first group).

- 2.2 - For the reasons given in section 2.1 above, no examination of claims 5 and 6 appears meaningful. However, and according to the prior art searched in the light of the parts of the description supporting claims 5 and 6, an inventive step in the subject-matter of claims 5 and 6 does not appear to be present in view of document D5 (EP 0 942 297 A) (see e.g. the abstract, paragraph 29 and claims 1, 7, 14, 15 and figure 3 thereof) (Article 33(3) PCT).

D5 discloses a manufacturing method for forming an optical element from a growth-controlled isometric crystal. Hence the selection of the [001] crystallographic face of said isometric crystal does not appear as inventive.

Thus, the subject-matter of **claims 5-6** appears to lack an inventive step in the meaning of Article 33(3) PCT.

For the same reasons as those above concerning claim 5, the subject-matter of **claim 7** appears to lack an inventive step in the meaning of Article 33(3) PCT.

- 3 - The application does not meet the requirements of Rule 5.1.(a)(ii) PCT (citation of relevant prior art documents, e.g. D1 and D5).

The application does not meet the requirements of Rule 6.3.(b)(i) and (ii) PCT (two-part form of the independent claims).

The application does not meet the requirements of Rule 6.2.(b) PCT (reference numerals in all the claims).

**WRITTEN OPINION
SEPARATE SHEET**

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The attention of the applicant is further drawn to the fact that if the application contains an unjustified plurality of independent claims, no examination of any of the claims will be carried out.